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ABSTRACT

Experimental and ethological studies were undertaken to clarify the role of positive and negative evaluations in the control of the child's performance on laboratory and classroom learning tasks. The results indicate that "social reinforcers" are effective to the extent that they communicate to the child unambiguous information on the adequacy of his performance. These events are normally of only modest effectiveness in the immediate control of performance as studied in both experimental and classroom settings. Negative statements, on the other hand, have been shown to be highly effective in both contexts. Further analysis suggests that the traditional focus upon social reinforcement processes oversimplifies the nature of the actual interpersonal controls used by the teacher. It is argued, in conclusion, that it is necessary to go beyond simple concepts of "social reinforcement" in order to come to grips with the interpersonal events that are effective in behavior development and behavior control. (Author/LAA)

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Chapter 1

Introduction and Background

The concern with the influence of praise upon learning and performance is one of the oldest in studies of human motivation and personality. Nevertheless, information on some basic issues of "social reinforcement" phenomena remains incomplete or obscure. One such issue concerns the relative efficacy of positive versus negative verbal outcome events. Are such words as "good," "fine," or "that's right" more effective for behavioral control than "wrong," "no," or "that's incorrect"? It is commonly assumed that children learn most efficiently under conditions of positive reinforcement. However, recent experimental studies indicate that children not only learn under conditions of negative evaluation but that performance is enhanced relative to conditions of positive evaluation (Hamilton, 1969; Marshall, 1965; Schroth 1970; Spence, 1966, 1970).

A second issue concerns the discrepancy between laboratory and field investigations. Some assessments of positive social reinforcement events in laboratory circumstances (e.g., Cairns, 1967, 1970; Curry, 1960; Spence, 1966) indicate that they are only modestly effective in the control of performance on memory, concept identification, and discrimination learning problems. Opposing results have been reported from a wide range of field or "behavior modification" studies. Changes in affiliation, aggression, creativity, and a variety of other behaviors have been reported by investigators who have carefully programmed the reward behavior of the parent or the teacher (Johnston, Kelly, Harris, & Wolf, 1966; Redd & Birnbrauer, 1969; Scott, Burton, & Yarrow, 1967). There is, however, surprisingly little information about the circumstances under which social reinforcement events typically occur in natural interactions.

In overview, the present work integrated some essential features of experimental and ethological methodologies to achieve a new perspective with respect to both issues. It was our expectation that the functions subserved by social reinforcement and criticism in the classroom are directly relevant to the control properties of these events elsewhere. Hence, a functional analysis of their occurrence in extralaboratory settings should clarify the reasons for their effectiveness, or noneffectiveness, in the laboratory.

The studies reported here were concerned with the analysis of social control properties in both settings. Each of the succeeding chapters will deal with a different aspect of the social reinforcement problem. Chapter 2 will report an analysis of the use patterns and efficacy of social evaluations in classrooms of the educable retarded. The next chapter (3) will cover comprable analyses in normal classroom settings. This work set the stage for tracing the behavior of individual children in classroom settings, to determine what, if not teacher social evaluations, served to control the direction and enthusiasm of the child's activities (Chapter 4). Finally, a re-analysis was made of the events that control the momentary efficacy of an adults social approval behavior in an experimental setting (Chapter 5). The last chapter of this report covers the conclusion and recommendations that can be offered tentatively on the basis of this work.

Chapter 2

An Experimental And Ethological Analysis Of Social Reinforcement With Retarded Children

The specific aim of the present research was to identify the roles that the different classes of social reinforcement play in behavior control in both a laboratory and field setting. The work was conducted in two parts. In the experimental assessment phase, children were taken from the classroom to a separate testing room. The efficacy of different types of experimenter-produced verbal outcomes was assessed and the effects of definitional modification procedures determined. In the second phase of the research, children and their teachers were observed in the classroom under conditions of normal interaction. The conditions under which teachers' social approbation or disapproval occurred were tabulated and the relative frequencies and functions of each type of event analyzed. All children in both phases of the work had been assigned to classrooms for the educable mentally retarded (EMR). In view of the emphasis that has been placed upon the importance of social reinforcement in the learning and behavioral control of retarded children, we were especially interested in the actual functions that these events served for them and their teachers.

EXPERIMENT 1

In an earlier investigation (Cairns & Paris, 1971), EMR children did not learn a concept identification task even when "correct" responses were followed by praise comments by the E. Other experimental conditions in that study suggest that the failure to learn was due to the child's inattention or misinterpretation of the verbal outcome events, as opposed to task difficulty. However, when a novel, nonsense word was defined as meaning "correct", most of the children ordered their behavior by its occurrence or nonoccurrence. Definition of the social reinforcers (i.e., the words "good" and "fine") did not enhance their effectiveness in behavioral control for these children. The results stand in contrast to results obtained with children of the same chronological age, but of normal intelligence, where definitional structure serves to enhance performance for both nonsense and "social reinforcement" words.

Experiment 1 was conducted to provide further information on (a) the relative effectiveness of positive, negative, and novel outcome events for EMR children and (b) the extent to which these outcome events are susceptible to manipulation by information induction (pretask definition) under experimental conditions.

METHOD

Subjects

Fifty-six children assigned to primary and intermediate public school classes for the educable mentally retarded served as Ss. None of the Ss were diagnosed as severely brain damaged or emotionally disturbed. The average CA was 9-8 (range 6-9 to 12-8) and the average IQ was 67.3 (range 48-88). The experimental groups were equated for CA, MA, IQ, and sex.

Design

The undefined uses of the different verbal outcomes "good," "ahwe", and "wrong" formed three experimental groups. "Ahwe" (pronounced aw'wee) is a Polynesian word meaning approximately "so be it." The word was judged to be semantically neutral by an independent sample of children on scales of correct-incorrect, good-bad, and happy-sad and has been used previously (cf. Cairns & Paris, 1971a). Four additional groups received pretask instructions defining "good" or "ahwe" as positive events or "wrong" or "ahwe" as negative events.

Apparatus

The apparatus consisted of a two-choice discrimination panel and control module. Two buttons were located symmetrically above and on either sid of a white jewel signal light on the vertical face of the panel. The choice panel was mounted upon a Formica baseboard that extended toward S. A hand print was inscribed on the baseboard immediately in front of S and equidistant from the buttons (15 inches). The signal light was activated from the control module situated by E and extinguished when S pressed either button.

Procedure

The E was introduced to each class before testing. Each child was escorted individually to a small testing room where he was given the following instructions.

> This is a new device I want you to work on. First you place one hand on this hand print [points] and keep it there until this [points] white light comes on. Put your other hand behind your back. When the light comes on, you can lift your hand and press either button. Then, put your hand back on the hand print and wait until the light comes on again. Remember, you put one hand on the hand print, wait until the light comes on, and then press a button.

These were the only instructions given to the groups who received the verbal outcome as undefined events. Five unrewarded practice trials ensued to ensure S's knowledge of the instructions and procedures. The following additional instructions were given to those groups receiving positive or negative cue induction.

> Whenever I say the [appropriate event], this means that you did the job [correctly/incorrectly]. Remember, the [appropriate event] means you did the job [right/wrong].

The E then activated the signal and began testing, following each "correct" response with the appropriate outcome event. The arbitrarily correct button was predesignated and counterbalanced so that each button was "correct" for half the Ss of each sex in each group. Each S received 30 trials.

Measures

A direct comparison of the performance of all groups with traditional acquisition measures is difficult because of the uncertainty of a "correct" response for those Ss in the nonsense word groups. Therefore, one objective measure of control by the verbal event was obtained by counting the number of occasions each child selected the button yielding the verbal event. This measure reflects the degree to which the child's performance elicited or failed to elicit (i.e., avoided) the comments. In a block of 10 trials, a score of 5 would be expected by chance or alternation and would reflect non-differential responding to the E-produced outcomes. This measure allows two distinct comparative tests among the three different types of verbal events. It permits comparison of the effectiveness of "good" and "wrong" to the effectiveness of a nonsense word. Each group can also be compared with the chance or indifference level of responding. Two additional, and correlated, measures were computed for direct comparison of the effects of positive and negative evaluations. One was the number of "correct" responses (i.e., the number of occasions Ss selected the button eliciting "good" or avoided the button eliciting "wrong"). The other measure was the proportion of Ss attaining criterion (i.e., nine of 10 responses on the same button).

RESULTS AND DISCUSSION

Performance Relative to Nonsense Words

A principal concern was whether the undefined positive and negative social reinforcement events differed in their effectiveness for EMR children. Using the mean number of responses yielding the verbal events, a comparison was made among the "good," "wrong," and "ahwe" undefined conditions. As shown in table 1, clear differences in effectiveness were obtained. Focusing on the last 10 trials, the group exposed to the word "wrong" produced significantly fewer responses that elicited the outcome event than did the group exposed to "ahwe" $t(14) = 2.72$, $p < .02$. The nonsense word and the positive social reinforcement conditions did not differ reliably from each other in

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Insert Table 1 about here

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the last 10 trials, $t(14) = 1.42$. Save for the apparently random downward fluctuation of the "ahwe" group in the second block of trials, the performance of the two groups was roughly parallel, with a modest advantage to the positive social reinforcement condition.

Performance Relative to the Indifference Level

The same measure can be used to compare the groups' performance with the indifference level. As illustrated in figure 1, the undefined "good" condition did not significantly deviate from the indifference level. However, the

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Insert Fig. 1 about here

TABLE 1

MEAN NUMBER OF RESPONSES YIELDING THE VERBAL EVENTS BY TRIAL BLOCKS

VERBAL CUE CONDITIONS	TRIALS		
	1–10	11–20	21–30
"Good":			
Positive	5.6	6.0	6.4
Undefined	6.0	6.1	6.5
"*Ahwe*":			
Positive	5.8	6.0	6.9
Undefined	5.0	3.6	5.0
Negative	3.8	2.3	2.4
"W/rong":			
Undefined	2.5	2.0	1.9
Negative	2.4	1.1	0.8

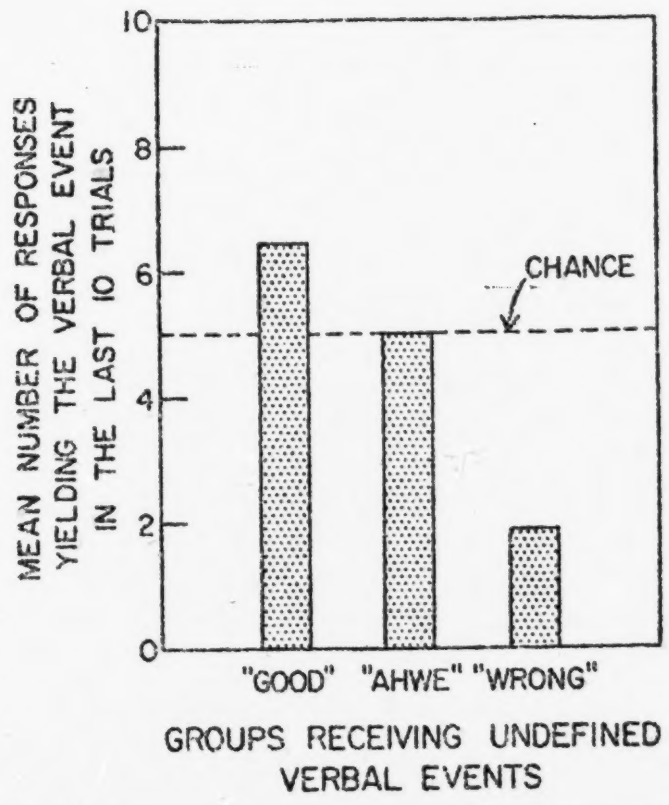

FIG. 1.—Performance of the groups receiving undefined outcome events

deviation of the negative evaluation condition "wrong" was statistically significant, t (7) = 3.39, $p < .01$. Again, the stronger influence of the negative comment is evident.

Performance Relative to Standard of Correctness

The effectiveness of "wrong" and "good" was compared directly using the number of correct responses. The summary data across trial blocks are shown in table 2. A 2 ("good" or "wrong") X 2 (defined or undefined) X 3 (trial

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Insert Table 2 about here

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blocks) analysis of variance yielded only a significant main effect of verbal event type, F (1,28) = 2.58, $p < .001$. Among the groups receiving positive and negative evaluative comments, negative comments produced more "correct" responses. This is consistent with the finding that only 25% of the Ss in the positive social reinforcement group reached criterion whereas 69% of those Ss in the negative condition attained criterion, Fisher exact $P = .014$.

Efficacy of Instructional Manipulations

The second question to which this study was addressed was whether special instructions could enhance the effectiveness of the various types of social-reinforcement events. The performance of the several structured groups is given in table 1, and the performance in the final block of trials relative to the unstructured groups is shown in figure 2. The instructional manipulations did not significantly enhance the effectiveness of either the positive or the negative social-reinforcement conditions. Neither group differed significantly from its nonstructured counterpart. While this result is consistent with previous studies of EMR children (Cairns & Paris, 1971; Spence, 1966), it is at variance with the findings obtained from same-age normal children. In the latter instance, instructions have typically served to increase the effectiveness of positive social-reinforcement events (Cairns, 1967; Spence, 1966).

Insert Fig. 2 about here

Nonsense words, however, were highly susceptible to the impact of definitional structure. As figure 2 shows, the novel word readily took on both positive and negative cue properties. The one-way analysis of variance with the number of responses yielding the verbal event was highly significant, F (2,21) = 5.93, $p < .01$. This finding partially replicates our previous report (Cairns & Paris, 1971a), where it was shown that EMR children were capable of utilizing information embodied in instructions about the meaning of novel, unfamiliar words.

TABLE 2

MEAN NUMBER OF CORRECT RESPONSES ACROSS TRIAL BLOCKS

VERBAL CUE CONDITIONS	TRIALS		
	1–10	11–20	21–30
"Good":			
Positive	5.6	6.0	6.4
Undefined	6.0	6.1	6.5
"Wrong":			
Undefined	7.4	8.0	8.1
Negative	7.6	8.9	9.3

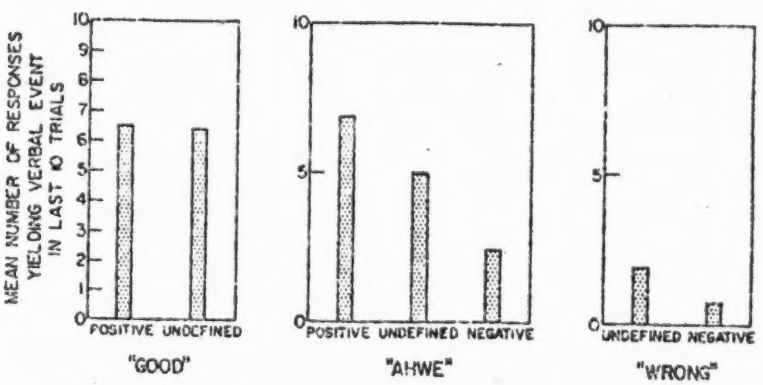

FIG. 2.—Performance of groups receiving definitional instructions relative to their undefined use.

TABLE 3

CONDITIONAL PROBABILITY OF OCCURRENCE OF POSITIVE AND NEGATIVE EVALUATIVE EXPRESSIONS AS A FUNCTION OF DIFFERENT TEACHER-CHILD INTERACTIONS[a]

FUNCTION OF EVALUATION[b]	TYPE OF VERBAL EVENT	
	Positive ("Good," "Right," "Fine," "OK"	Negative ("Wrong," "That's poor," "Incorrect," "No good"
Organizational (nonevaluative) ...	.39 (81)[c]	0 (0)
Informational	.28 (58)	.70 (19)
Qualitative evaluation	.27 (56)	.19 (5)
Query	.04 (8)	0 (0)
Permission	.03 (7)	.11 (3)
Overall probability and frequency ..	.89 (210)	.11 (27)

[a] N = six teachers; each observed in two sessions.
[b] As determined by context of teacher-child interaction.
[c] Frequency (i.e., total number of instances) indicated in parentheses.

To summarize the results of the first part of the investigation, it appears that there is indeed a difference in the "base line" effectiveness of positive and negative social-reinforcement events. This difference appears in comparisons with a control or nonsense word, with an indifference level of performance and with direct comparisons of "good" and "wrong" conditions. The principal finding is simply that the traditional negative social reinforcer "wrong" is more effective in the control of performance on this task than the positive social reinforcer "good." While we did not explore alternative expressions of social reinforcement events, parallel studies using different words, tasks, and populations have yielded results consistent with this finding (Spence, 1970). What is distinctive about this population (i.e., children labeled mentally retarded) is the failure of special instructions to enhance the effectiveness of "good."

EXPERIMENT 2

Given that expressions of positive evaluation are inefficient in laboratory settings, one can question what functions they serve in "normal" interactions. Earlier, we proposed that one of the principal reasons for the ineffectiveness of social reinforcers is that they are relatively ambiguous events for the child. This proposal was based on the speculation that positive evaluative statements, including such words as "good," "fine," and "all right," tend to occur frequently and indiscriminately in everyday interactions. Negative evaluations, such as "no," "that's wrong," and "poor," were presumed to occur not only less frequently but more specifically (i.e., referring to particular acts as opposed to qualities of the child or general characteristics of his performance). While this proposal seemed plausible, and seemed to agree with common experience, virtually no information is available on the actual functions that such evaluations serve in dyadic interactions.

METHOD

Classrooms Observed

Six different primary and intermediate special-education classrooms for EMR children, including the ones from which Ss in experiment 1 were drawn, constituted the primary observation group. For reliability analyses, video films of additional classroom interactions were also observed.

Interaction Coding

The behavior analysis was focused upon the evaluative comments of the teacher and the events that immediately preceded the comments in the classroom. The coding involved making a continuous record of the behavior interchanges between the teacher and the class, recorded every 5 seconds. Preliminary work provided a breakdown of several functions of evaluative comments into five major categories, with the apparent function being determined by the events that immediately preceded the comment. The five summary categories identified were the following:

Organization - The evaluative comments by the teacher were not contingent upon any clearly specifiable response of the child or his differential responding. It served as a type of place marker in the teacher's verbal behavior or as a stereotyped expression which signaled to the children that one activity was terminated and another about to begin. Such uses included the following: "All right, class open your workbooks," or "OK, let's go outside."

Information - Informative comments occurred immediately following a child's response that was objectively correct or incorrect. Such usages frequently occurred in recitations where the dyadic interchange involved (a) a teacher's question, (b) a child's response, and (c) an evaluation of the response. Informational functions are not limited, however, to instances where there is a direct question. Any occasion where the evaluative comment is preceded by the production of an objectively correct or incorrect response would be categorized as informational.

Qualitative evaluations - These comments followed a discrete response of a child, but it was unclear to the observer whether the response met the standards which had been previously set by the teacher or whether the judgments were qualitative and subjective. Qualitative evaluations typically occurred during and following the reading recitation, presentation of papers for checking, and in other settings where performance was relative and there was no single correct response.

Query - Evaluations sometimes occurred as a probe for understanding, for example, "All right? Do you understand?" or simply "OK?"

Permission - These comments are used by the teacher to grant or deny an explicit request by the child.

The interrater reliability of the several categories was checked by two independent judgments of 11 different 5-minute sections of video-taped classes. The reliability of the major positive categories, organizational, informational, and qualitative evaluations, were adequate, with the product-moment correlations at .92, .96, and .96, respectively. The use of negative comments in the 11 sessions was so rare that the reliability of the individual categories could not be established.

Procedure

Following introduction to the class, the E took a seat at the periphery of the class. The class was observed for 20-30 minutes in each session, but data were collected only in the last 10 minutes of each observation. Each class was observed in two independent sessions, yielding two replicated 10-minute observations per class. Each session was summarized in 120 5-second observation blocks.

RESULTS AND DISCUSSION

As shown in table 3, the teachers differed markedly in their use of positive evaluations relative to negative ones. Positive comments occurred

about eight times as frequently as negative comments, t (10) = 6.31, $p < .001$. The 237 total evaluative comments in 120 minutes of observation mean that a "social reinforcer" was dispensed by the teachers at an average of once every 30 seconds.

The two kinds of comments differed in terms of the functions that they served as well as in frequency of occurrence. To express the relative distribution of the comments independent of frequency, the conditional probabilities of occurrence (i.e., frequency within a specific category/frequency over all categories) for positive and negative remarks are shown in the body of table 3. The most interesting comparisons involve the use of the "evaluations" in an organizational fashion. Given that the evaluation is a positive one, the probability of its serving an organizational function is .39. In contrast, negative evaluations never served such a function ($p = .00$). When negative evaluations did occur, they typically served to denote the incorrectness of some specific response of the child (informational), $p = .70$. Further, virtually every negative comment was contingent upon a particular response of an individual child. In contrast, 39% of the teacher's positive "social reinforcers" were organizational (i.e., delivered independently of the children's activities).

In summary, positive evaluations occurred much more frequently, served more diverse functions, and were less contingent upon behaviors of the children than were negative evaluations.

GENERAL DISCUSSION

This research combined an experimental analysis of the cue properties of evaluative comments with a naturalistic account of the functions that such events serve in everyday interchanges. Despite considerable speculation, including our own, surprisingly little data have been previously available on the functions served by "social reinforcers" in the child's everyday life. The present observations yield information on two significant issues in the social-reinforcement literature.

A primary issue in studies of social reinforcement concerns the differences obtained by "right" and "wrong" reinforcement combinations. Saying "right" after correct responses and nothing after incorrect responses (RN) is typically inferior in promoting learning relative to combinations of wrong = nothing. Indeed, this effect was replicated in experiment 1 with retarded children. Acceptance of this finding has been limited despite a large supportive literature (Buss & Buss, 1956; Schroth, 1970; Spence, 1970). Perhaps this resistance has been nurtured by the lack of an adequate explanation of the differential effectiveness. Spence ascribes the differences to those Ss in the RN condition who treat nonreinforcement as indicating correct performance. Alternatively, Cairns (1967, 1970) and Schroth (1970) have argued that the differences are due to "right" being a more ambiguous or less attended signal than "wrong." The results of experiment 2 lend supportive evidence for the latter, or informational, interpretation. Given that the reinforcing effectiveness of a social stimulus is determined by such factors as frequency of use, contingency, and reliability, gross differences are evident between positive and negative evaluative comments. Positive comments occurred eight

times as often as negative events but also occurred independently of children's behavior nearly 40% of the time. This frequent and indiscriminate use may be expected to attenuate the information conveyed by the positive comments (Gewirtz & Baer, 1958; Landau & Gewirtz 1967; Warren & Cairns, 1972).

Returning to the matter raised in the introduction of the paper, it seems clearly established that the two general classes of evaluations differ markedly in terms of their effectiveness (experiment 1) and in terms of their functions in everyday interactions (experiment 2). Instead of being discontinuous, the results of the laboratory analysis and the naturalistic observations mesh neatly and yield a coherent, if incomplete, picture of social evaluation effectiveness. The further exploitation of the intersect between experimental and naturalistic research strategies seems required in order to understand the dynamic role that social evaluations play in the control of dyadic behavior.

SUMMARY

The effectiveness of positive and negative evaluative comments for mentally retarded children's learning was assessed in a 2-choice discrimination task. It was found that negative comments after incorrect responses greatly facilitated learning while positive comments after correct responses had little effect. A possible explanation of this differential effectiveness was suggested by a second study which involved a naturalistic analysis of the use of evaluative expressions in the classroom. This analysis indicated that positive evaluations were used more frequently and indiscriminately and were less contingent upon children's behavior than negative comments. A distinctive feature of the work was its emphasis upon gains to be made from an integration of traditional experimental methods with ethological analyses of children's behavior.

Chapter 3

The Multiple Functions of Social Reinforcers

Social reinforcement has been a provocative and prolific source of research for many years. This may be due in part to its readily identifiable and simple stimuli (e.g., "good," "right," "wrong"), the easy extrapolation to laboratory tasks (e.g., marble dropping) and its utility as an explanatory construct in theories of social development. However, a number of problems exist with the concept of social reinforcement that cannot be overshadowed by its apparent methodological simplicity nor its theoretical utility.

On the present view, social reinforcers are multi-faceted, interactive stimuli which cannot be considered independently of the people involved nor the context of occurrence. This research is based on the premise that social events acquire many cue properties and serve diverse functions. Neither these events nor social development can be adequately explained by recourse to an intuitively designated class of "social reinforcers."

The present investigation involved two experiments. In the first experiment we wanted to focus on one specific cue property, namely information, of verbal evaluations commonly denoted as social reinforcers. Several studies have suggested that positive evaluative comments often do not promote learning or alter performance to any appreciable degree (Cairns, 1967; Paris & Cairns, 1972). A great deal of research has been devoted to demonstration of functional relationships between social reinforcement effectiveness and race, SES, IQ, satiation and deprivation, arousal and social reinforcement standard or history. Unfortunately, the establishment of the effective properties of the event are rarely examined. Instead, correlations are reported between the debilitating or facilitating effect of the event and some organismic or demographic variable. The transituationality and universal effectiveness of social reinforcement is usually assumed without regard for the underlying, stable mechanisms of social control and interaction. The present research was an attempt to investigate the relative effectiveness of praise and criticism, and then pursue an explanation of the origin of the differences in everyday social encounters.

Experiment I included an assessment of the control of praise words ("good," "fine") relative to criticism ("wrong," "no") and a non-meaningful word control group. The study also investigated the modification of the signal or informational properties of verbal comments in order to ascertain the plasticity of utility of a social cue in a given context. Experiment II was designated to investigate the actual uses of positive and negative comments in nonlaboratory settings. Elementary school classrooms were observed and the frequencies and functions of teachers' evaluative comments were recorded. Although the central focus again was on the informational aspects of evaluative comments, Experiment II was concerned with the multiple functions of social reinforcers in different contexts.

EXPERIMENT I

This study was part of an ongoing research program in the assessment of the effectiveness of praise and criticism on children's simple learning tasks. We were particularly interested in determining the customary efficacy of positive comments such as "good" and negative comments such as "wrong" because of the theoretical implications for concepts of social reinforcement and the practical issues of effective social control and motivation in a learning environment. In addition to assessment we wanted to know if a social comment's effectiveness could be manipulated for children by emphasizing its signal function within the experimental context. In the present experiment, the information was induced directly during the pre-task instructions.

METHOD

Subjects

Ninety first and second grade children ($\overline{CA}$ = 7-6, range = 6-8 to 9-0) from local public school participated in this study. Assignment to experimental treatments was random with the provision that each group include five boys and five girls.

Design

Three different evaluative comments, good, ahwe, and wrong, were used as outcome events. Ahwe (aw'wee) is a Polynesian word and has been reliably used as a novel comment previously (cf., Paris & Cairns, 1972). The comments were structured in three ways; the event could be defined before the task as indicating correct performance or incorrect performance or simply not defined a priori at all. The induction of signal properties was given in the pre-task instructions. In summary, there were nine separate groups formed by the three different comments and three signal functions, defined positive, defined negative and undefined.

Apparatus

The apparatus consisted of a two-choice discrimination panel and a control module. Two buttons were located symmetrically above and on either side of a white signal light on the face of the panel. The choice panel itself was mounted upon a formica baseboard that extended toward the subject. A handprint was inscribed on the baseboard immediately in front of the subject and equidistant from the buttons (37.5 cm). The signal light was activated from the control module, situated by the experimenter. The light was extinguished when the subject pressed either of the buttons.

Procedure

The experimenter was introduced to each class before testing. Each child was conducted individually to a small testing room where he was given the following instructions.

This is a new device I want you to work on. First, you place your hand on this handprint (points) and keep it there until this (points) white light comes on. Then you can lift your hand and press either one of these buttons (points). Finally, you put your hand back on the handprint and wait until the white light comes on again. Remember, you put one hand on the handprint, keep your other hand behind your back, wait until the light comes on and press a button.

Following these instructions, subjects were told to "try it a few times for practice." Five trials ensued and the experimenter insured that the subject pressed each button at least once during the pretraining. These were the only instructions given to those groups who received the verbal outcomes as undefined events. The following additional instructions were given to those groups using the outcome event as a positive or negative cue:

Whenever I say (the appropriate comment) this means that you did the job (correctly/incorrectly). Remember, (the appropriate comment) means you did the job (right/wrong). This latter sentence was repeated after the 10th and 20th trials with the aim of maximizing learning.

Care was taken to insure comprehension of the instructions and questions were answered by repetition of pertinent parts of the instructions.

The experimenter then activated the signal light and began testing, following each "correct" response with the appropriate outcome event. The arbitrarily "correct" button was pre-designated and counterbalanced so that each button was "correct" for half the subjects in each group. The discrimination learning task continued for thirty trials.

Measures

A "correct" response was not readily definable for the undefined ahwe condition. Therefore, the measure of performance was regarded as the number of responses which yielded the verbal outcome. This presumably reflects the subjects' effort to obtain or avoid the experimenter's comments. The number of correct responses was also used in direct comparisons of the effectiveness of good and wrong as well as the number of subjects meeting criterion.

RESULTS AND DISCUSSION

Performance of undefined outcome groups

The performance of subjects hearing undefined comments can be used as a baseline measure of the effectiveness of those comments. Subjects receiving good and ahwe as undefined outcomes performed at approximately chance levels as shown in Figure 1. Indeed, the two groups did not differ,

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Insert Figure 1 about here

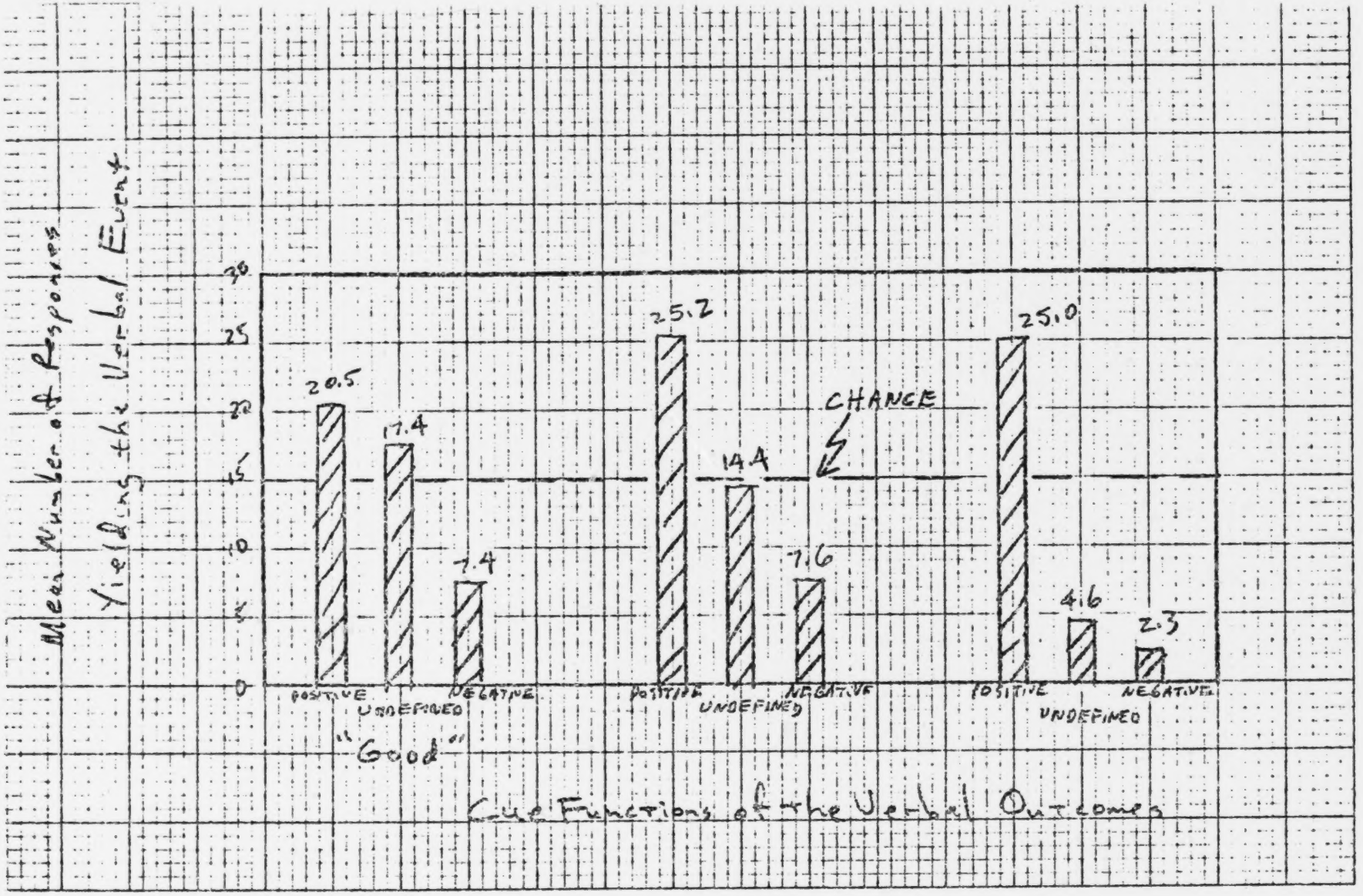

Figure 1

10 Squares to the Inch

$t(19) = 1.25$, indicating that normal usage of praise did not affect performance in a manner appreciably different than a nonsense word. On the other hand, subjects in the undefined wrong condition consistently avoided the incorrect response button and successfully learned the discrimination. Their performance was very different from the undefined ahwe condition, $t(19) = 4.79$, $p < .01$. The efficacy of undefined praise and criticism can be directly assessed by comparing subjects in each group on the number of correct responses. Subjects receiving wrong for incorrect responses demonstrated significantly better performance, $t(19) = 3.60$, $p < .01$. In summary, the data suggest that undefined negative comments promoted discrimination learning significantly better than positive comments which were no more effective than an undefined nonsense word.

Efficacy of instructional manipulations

One of our basic concerns was whether or not the signal functions of the comments and their efficacy could be contextually manipulated. The induction of positive and negative signal properties through the pre-task instructions was very effective as evident in Figure 1. The defined signal conditions resulted in better performance than the undefined conditions for all three verbal comments. Both positive and negative groups receiving wrong as an outcome were significantly different from the undefined group, $p < .05$. However, only the positive ahwe group and the negative good group were significantly different from their undefined uses. Although performance improved in the other groups relative to undefined usage the improvement was not statistically significant. The lack of facilitation for good does not seem to be due to a ceiling effect and in fact, was obtained with EMR subjects also (Cairns & Paris, 1971; Spence, 1966).

It appears that the information denoting the contingency between a subject's response and the comment is not implicit within praise or criticism and restructuring of this contingency usually facilitates performance. Indeed, dissonant meanings were imparted to good and wrong in two of the conditions where good served as a signal for an incorrect response and wrong as a signal for a correct response. Both comments were employed by subjects in dissonant fashions to order their performance. The instructional manipulations in general demonstrate the flexibility of meaning which can be contextually attributed to evaluative comments and the performance gains obtained by this restructuring or redefinition. The clarification of signal properties is in many ways similar to the restructured environments employed in operant conditioning and behavior modification programs.

Performance relative to standard correctness

A 3(Comments) x 3(Signal Definition) x 3(Trial Blocks) analysis of variance on the number of responses yielding the verbal events produced a highly significant trial blocks effect, $F(2, 162) = 7.19$, $p < .01$. This indicates that subjects learned the contingencies between the comments and their responses. This would not be expected ordinarily if one assumes that

performance should improve for positive cues and decrease for negative cues in some equal fashion. The trial blocks effect appears due to the generally better performance of subjects in negative cue conditions and the undefined wrong group because the total number of responses yielding the verbal outcomes decreased over trials.

Another method to ascertain the degree of learning within each experimental group is to compare the number of subjects reaching criterion. The number of subjects in each group who consecutively responded on the correct button ten times is shown in Table 1. (Any consistent response was counted

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Insert Table 1 about here

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in the undefined ahwe condition.) It is clearly shown that more subjects learned the discrimination when instructions defining the signal function of the comments were given. The general superiority of the wrong conditions and negative cue conditions is also evident.

In summary, subjects receiving good as an undefined outcome event did little better than subjects receiving a nonsense word. Contextual definition facilitated performance with good somewhat. However, subjects receiving wrong as an outcome event performed much better in both defined and undefined signal conditions. The "reinforcing" power of good for the subjects in this experiment was slight in comparison with the control exerted by wrong.

EXPERIMENT II

The results of Experiment I suggest that positive and negative evaluative comments are differentially effective in their influence on children's simple learning tasks. This effect has been observed in a similar task with retarded children (Paris & Cairns, 1972) and several studies with normal children (Marshall, 1965; Schroth, 1970). Given this differential effectiveness, it seemed reasonable to expect that the differences in the laboratory effectiveness of evaluative comments could be traced to everyday differences in usage. Experiment II was an investigation of the functions of evaluative comments in elementary school classrooms. The in situ observational procedures employed and the hypothesis-testing character of the research typify the ethological methodology.

METHOD

Classrooms Observed

Four first, four second, and four third grade classrooms in the same local public school were each observed twice. Classroom "visitors" were a common occurrence in this school and apparently were not disruptive events.

Table 1

Proportion of Subjects Meeting Criterion

in each Group

Signal	Evaluative Comment		
	Good	Ahwe	Wrong
Positive	.60	.80	.70
Undefined	.00	.10	.90
Negative	.80	.90	1.00

Procedure

A male observer entered each classroom and was introduced by the teacher. The observer was positioned on the periphery of the group activity and did not interact with the children or teachers. The observer remained in the classroom for 20-30 minutes but collected data only during the last 10 minutes. Each classroom was observed twice within one week.

The behavioral analysis was focused on the evaluative comments of the teacher and the events in the classroom that immediately preceded the comments. A continuous record of the interchanges between the teacher and class, recorded every 5 seconds, coded the use of the teacher's evaluative comments. Earlier work provided five major categories of the several functions of evaluative comments, with the apparent function being determined by the interactive events that immediately preceded the comments. The five summary categories are briefly defined below.

Organization: These comments were not contingent upon any clearly specifiable response of the child. Often the remarks appeared to mark time or organize the speaker's remarks, or to signal a change in the classroom activity. Such used included, "all right, everyone take your seats," and "OK, let's quiet down."

Information: Any occasion in which the evaluative comment of the teacher was preceded by the production of a objectively correct or incorrect response by the child was categorized as informational. An example would be approbation following the child's correct response to the query, "What is 49 minus 16?"

Qualitative Evaluation: Teacher comments which involved the comparison of a particular response of the child against a local, individual, or unspecified standard were classified as qualitative evaluations. For instance, the teacher might say "good" following the reading of a short paragraph by the child.

Query: Evaluative comments with a rising intonation were sometimes used as probes for understanding. For example, "All right? Do you understand?" or "OK?"

Permission: These comments were used by the teacher to grant or deny an explicit request by the child.

The reliability of the categorization procedure was determined by two raters independently viewing 11 different 5 minute time samples of videotaped classes. Calculations were made only on those categories where behaviors occurred frequently enough to compute meaningful product moment correlations. The interobserver reliabilities for the major positive categories Organization, Information and Qualitative evaluation were .92, .96, and .96 respectively.

RESULTS AND DISCUSSION

An analysis of variance with the frequencies of comments in each category revealed no significant differences between grades, teachers or the two repeated observations. For this reason, the data from all 12 classrooms were

grouped together. Table 2 summarizes the results according to the type of

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Insert Table 2 about here

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evaluative comment and the function it served. There were two striking features of the results. First, positive evaluations occurred much more often than negative comments. In fact, teachers delivered nearly seven times as many positive expressions as negative ones, (Wilcoxon Test, $N = 12$, $p < .01$). Second, there was a marked difference in the functions served by approval and censure comments. This is graphically illustrated in Figure 2 where it can

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Insert Figure 2 about here

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be seen that positive comments functioned primarily to organize the speakers' behavior. These comments did not signify the appropriateness of children's behavior almost 40% of the time that they were delivered. This means that praise words which are commonly denoted as social reinforcers are used quite often independently of the behavior that they are supposed to control. The primary usage of negative comments, in the other hand, was informational. Negative comments did not serve an organizational purpose and indeed were used in less diverse functions than positive comments. Although negative comments did not occur with high frequency, when they did occur, the comments usually referred to a specific response of the children.

The results of Experiment I virtually replicated an analysis of evaluative comments in special education (EMR) classrooms (Paris & Cairns, 1972). The only difference was the even more restricted use of negative comments as informative events. Overall, criticism was used less in special classes and then only as a corrective, informative signal. Taken together, the observational studies suggest that positive and negative comments do serve different functions in the classroom and occur with different frequencies.

GENERAL DISCUSSION

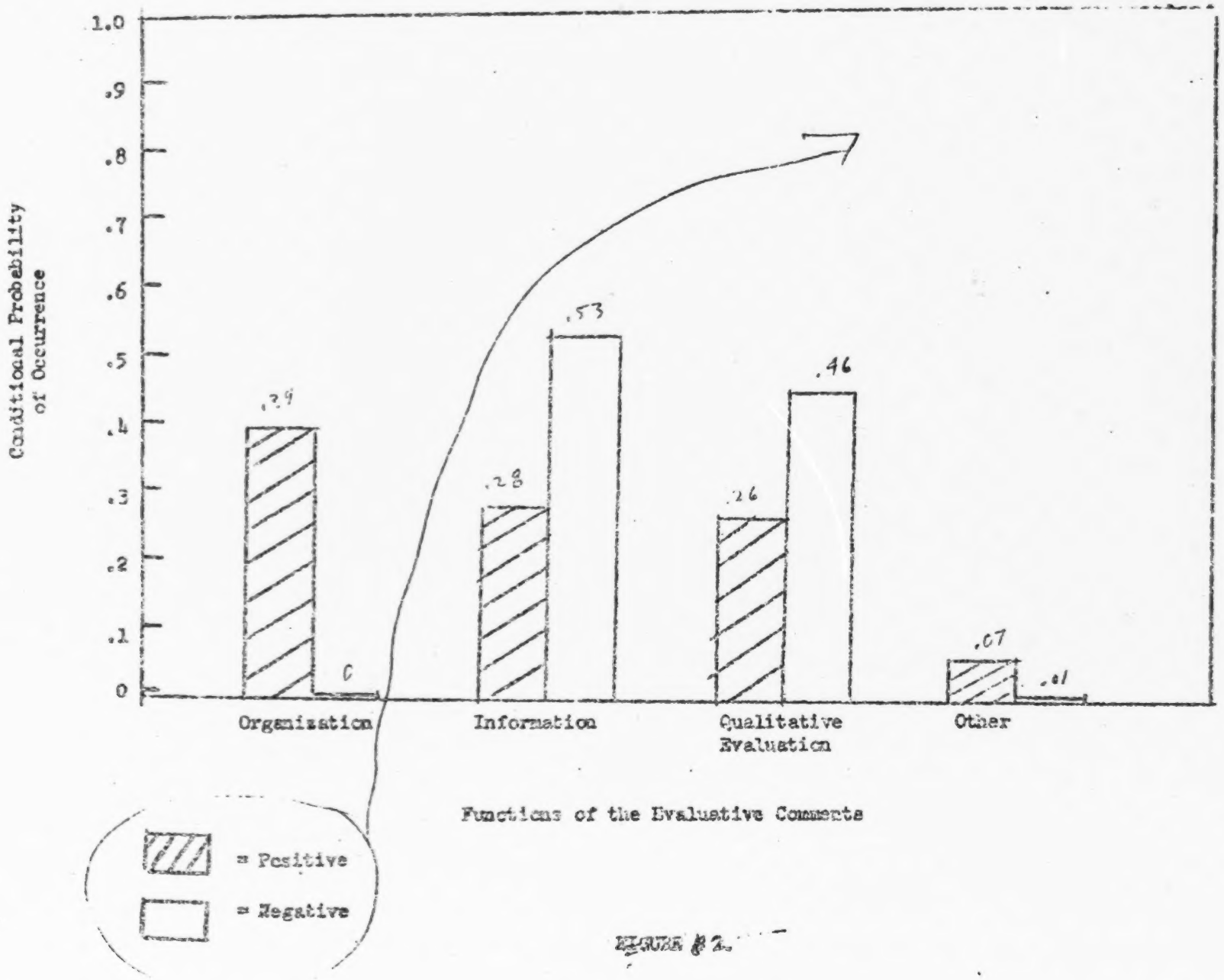
In the classroom, positive comments were used more frequently and in more functions than negative comments. This finding is consistent with Boucher and Osgood's (1969) Pollyanna hypothesis which asserts that there is a universal human tendency to use evaluatively positive words more frequently and diversely than evaluatively negative words. The findings of Experiment II and the Pollyanna hypothesis support our earlier proposal that ". . . words of assent approval, perhaps as a result of their commonplace and nondiscriminant usage, are relatively ambiguous events for many subjects . . ." (Cairns, 1967, p. 356). Further corroboration is offered by Schroth (1970) who made a similar point in his discussion of the general finding that saying "Wrong" (W) after incorrect responses and nothing (Blank) after correct ones (BW) leads to fewer errors than saying "Right" (R) after correct responses and nothing after incorrect ones (RB). He concluded that these results taken overall ". . . support the theory that the informative feedback effects of the-

Table 2

Conditional probabilities of occurrence of positive and negative evaluative expressions[a]

Type of Verbal Event	Function of evaluation (as determined by context of teacher-child interaction)					
	Organizational	Informational	Qualitative Evaluation	Query	Permission	Overall Probability
Positive (e.g., good, right, fine, OK)	.39 (196)	.28 (139)	.26 (129)	.05 (23)	.02 (9)	.87 (496)
Negative (e.g., wrong, that's poor, incorrect, no good)	.00 (0)	.53 (39)	.46 (33)	.01 (0)	.00 (1)	.13 (73)

[a]Frequency is shown in parentheses



Functions of the Evaluative Comments

FIGURE # 2.

earlier studies can be attributed to the lesser ambiguity of W signals in comparison with R signals . . . [p. 836]." This does not imply that the differences in effectiveness between BW and RB are entirely due to different signal properties of the comments themselves. Blank, or nonreinforcement, does play a role (Spence, 1970). The information denoted by Blank, though, appears to be derived from (a) a tendency to repeat responses which are neither praised nor criticized and (b) by comparison to available comments (Williams, 1972). However, Blank may assume signal properties relative to the overt comment and the absence of an ambiguous comment in RB may also be ambiguous whereas the absence of an informative comment in BW would also be informative. The long-term net effects of differential uses of praise and criticism may result in a strategy which says to continue present responding until told otherwise which would yield the customary laboratory differences between RB and BW.

The relationship of the present findings to the experimental operations by which positive social evaluations are enhanced in effectiveness requires comment. The enhancement is accomplished most simply, and directly, by instructing the child to attend to the contingency between the verbal event and his specific responses. In the light of the present results, it appears that this manipulation is effective because it serves to delimit the function of positive comments for the child in the experimental context. In effect, the instructions restrict the function of the positive expression to its response-contingent service as opposed to its organizational, or response-independent service. The instructions, or discriminative contextual use, re-define positive evaluative comments as contingent, unambiguous signals to the child. Once this is accomplished, performance of normal children under conditions of positive comments improves greatly.

Although the present work indicates that sharp discrepancies exist between the normal frequency and functions of positive and negative evaluations, it provides no direct information on the crucial question of <u>why</u> the discrepancies exist. In the light of the frequently replicated finding that negative evaluations are in face more effective than positive ones in the mastery of simple learning and discrete concept identification problems, the distribution of actual usage seems all the more paradoxical. At this point, only speculative suggestions can be offered. One such speculation is that the usage of the various terms is self-limiting because of the feedback effects produced. The feedback could be dyadic, due to the reactions elicited in the other person, or intrapersonal, due to the states produced in the speaker. A second possibility is that the long-term effects of the different kinds of evaluations might be quite different from their immediate or short-term effects. It might be the case that the positive evaluations over the long run tend to favor the development of interactions which have the net effect of promoting mutual positive regard and enhanced performance. Or it may be that the extended use of informative negative comments decrease or inhibit the child's attention to the speaker and the criticism. The teacher's evaluative behavior would then represent a subjective compromise between these two effects. These two accounts are not necessarily disjoint and both appear to be worthy of further detailed examination.

Evaluative comments and social stimuli in general are not unitary events and the understanding of social development is increased very little by nominal explanation and categorization of "social reinforcers". The conceptual emphasis on the variety of functions of evaluative comments provides greater clarification of the interactive, supportive roles of these events. It also affords a comparative analysis of the efficacy of particular functions. The results of this investigation also suggest that these issues can be profitably studied through naturalistic or ethological methods which may be more closely linked to the behaviors we wish to explain.

Chapter 4

Interpersonal Controls of Child Behavior in the Classroom

Theoretical treatments of social behavior development have traditionally assigned social reinforcement processes a major burden in the establishment and control of the child's day-to-day behavior. The preceding laboratory analyses of social reinforcement efficacy suggest, however, that the emphasis has been misplaced. Observations of classroom interactions provide further questions on the adequacy of the interpretation that social reinforcement is the primary mechanism of social behavior control.

Such results raise the important question, "If not social reinforcement, then what are the effective controls?" One answer is suggested by the analysis of the experimental operations that have proved to be effective in the enhancement of positive evaluation statements in the laboratory context. It has been reliably found that procedures that delineate the meaning of approval in the experimental context, or draw the child's attention to its relevance for his behavior, serve also to enhance the effectiveness of the event. The effective procedures include such diverse manipulations as giving him direct instructions, frightening him, training him to selectively attend to the verbal statements of the experimenter, or by using the "approval" events in a highly discriminative, unambiguous fashion in an interaction prior to the test. Such operations are not required to enhance the effectiveness of negative events.

These outcomes would be consistent with the proposal that a major source of control on the child's behavior would be the prior directions and immediate structure given to the child. The recognition that the way the situation is structured, either through prior experience and expectations or through verbal directions and commands, plays a primary role in behavior control is a matter of no little importance for social learning models. If the proposal is taken seriously, it would require a re-evaluation of the contribution of events antecedent to the behavior to be explained. Accordingly, "social reinforcement" events could be viewed in terms of their information transmitting and signalling function. Rather than serving to automatically "consolidate" the preceding activities, social reinforcement and punishment would be considered as directional signals which serve to clarify the adequacy of the child's ongoing behavior.

It would seem at this point quite useful to identify what are the principal interpersonal controls that seem to be operative in classroom interchanges and activities. While such data may not permit us to precisely delineate the learning mechanisms involved in classroom control, any model surely must be consistent with such information. Moreover, in the light of the hegemony of the social reinforcement assumption in theories of social development and teaching, it would seem to be of considerable importance to identify what roles such events actually serve in a common interaction circumstance.

Two major observational studies of classroom and individual behavior have been completed. One involved a focus upon the precise events that immediately preceded and followed the delivery of social evaluations. In addition, the wording and verbal context in which the events occurred were recorded. These observations were taken in several different classrooms, and twenty observations of each event were recorded in detail. In addition, time-sampled frequencies of the various evaluative events were recorded in each classroom.

The second study involved the tracking of behavior in 20 children, 10 boys and 10 girls, as obtained in two independent twenty minute observation periods for each child. Auditory tapes were made of the classroom interchanges at the time of each observation. From the tapes, a complete transcription was possible so that the various forms of verbal directions, evaluations, and questions could be accurately recorded. The focus in the second study was upon the effective controls of moment-to-moment activity. Essentially, this work was designed to provide a preliminary answer to the question, "If not social reinforcement, then what are in fact the effective controls on the child's behavior?" It was expected that the principal determinants of the major transitions in the child's activity would be the events in the immediate context, and primarily the setting produced by the teacher's directions and demands.

METHODOLOGY

EXPERIMENT 1

Subjects

Eight classrooms in the Monroe County Community School Corporation, with approximately 25 pupils in each class. The classrooms were composed of third, fourth, and fifth grades.

Procedures

Each classroom was observed for as many days as were required to complete the criterion of the observation of 20 positive evaluations and 20 negative evaluations. In each observation, the eliciting events for evaluations, the exact statement of the evaluation and the verbal context in which it occurred, and the behaviors of the child that immediately followed the evaluation were recorded. The procedure involved a record of the behavior subsequent to every evaluation in four consecutive 15 second time blocks. Insofar as possible, the teacher's comments were recorded verbatum.

Positive and negative events were recorded sequentially. After a complete record was taken for a positive instance, the next event recorded was a negative one, and on, alternately, until a total of twenty such events were tabulated. Ordinarily this required 6 to 10 hours of classroom observation (to complete the total of 20 positive and 20 negative evaluations).

To ensure comparability to the earlier observations (reported in Chapt. 2 and 3 of this report), two 10 minute time samples were also taken of teacher-evaluation behavior prior to the first instance, and between the 10th and 11th instances of the positive events.

In summary, the detailed behavior record provided (a) the eliciting conditions for social evaluations of both a positive and negative sort, (b) the verbal context of the evaluation, and (c) the immediate consequences produced in the child behavior.

EXPERIMENT 2

Subjects

Twenty children, 10 boys and 10 girls, selected at random from 10 3rd, 4th, and 5th grade classrooms in the Monroe County Community School Corporation. The schools were located in middle and lower-middle class socioeconomic residential areas.

Procedure

Prior to the observations, each teacher was informed that a detailed record would be made of the events that serve to control and direct the activities of two of the children in the classroom. The observer then acquainted herself with the classroom, and following a predetermined schedule, designated two children to be observed in that class. The procedure involved the tracing of the activities of the child for a 20 minute period on one day, then an additional 20 minute period on a following day. In the observation record, a detailed account was made of the child's activities, with an entry made each five seconds of the observation period. The behavioral code used provided an indication of the activity with respect to the teacher, peers, experimenter, as well as the child's performance on the classroom assignment. A record was also made of the various controlling events that potentially could be implicated as determinants of the child's ongoing behavior, including instructions, lectures, comments, and evaluations of the teacher, comments and behaviors of peers, and self-produced activities. The major transitions in the child's responses could then be keyed, in a retrospective analysis, to the several events that are operative in the classroom setting. Particular attention was given to the verbal activities of the teacher, and these were recorded on a miniature but powerful long-play Sony cassette recorder (Sony model 155). The recorder itself was small enough (3" X 5" X 1 1/2") to be inconspicuous, but provided a reliable account of the verbal statements of the teacher.

The analysis was focused upon the likelihood that a given type of event (e.g., positive evaluation, negative evaluation, direction-instruction, question) would alter the ongoing activity of the child. The statistical analysis summarized the control properties of a given teacher-produced event in the light of the probability that it elicited a corresponding change in the behavior of the child or of the class as a whole.

In addition, the verbatum record taken from the audio-record provided the basis for identifying the precise context of both instructional and evaluational statements. This information, taken in conjunction with the detailed individual record of the child's activity, yielded a clear account of the control properties of the various classes of events in a natural "classroom" setting.

PRELIMINARY RESULTS AND DISCUSSION

The primary data have been collected in both studies, but the data analysis at the time of this report is incomplete. Only a preliminary report can be offered at this point. From the two experients, the trends indicate:

a. The assumption that social reinforcement events occur somehow independently of the verbal behavior of the teacher is an unfortunate simplification of the actual interchange process. Approval statements (such as "good," "all right," "fine," etc.) as well as disapproval ones ("that's wrong," "no," "incorrect") normally are embedded in a longer discourse, and seldom occur as disembodied, single events. In particular, negative events, when they do occur, tend to be confounded with additional directional statements by the teacher on what is incorrect or wrong about the response or activity, and what it is that the child must do in order to improve his performance. The abstraction of "negative reinforcement" as not containing positive information simply does not jibe with the occurrence of these events in the classroom interchange. The verbal statements in which negative events occur are significantly longer, in terms of number of words that the teacher uses, than are verbal statements in which positive evaluations are made. Both, however, tend to be confounded with further information on what is the appropriate behavior for the child.

b. Events that elicit negative events tend to be either previously prohibited activities, or blatantly incorrect responses. Events that elicit positive events, on the other hand, are much more diverse and less readily identifiable as being behaviors that have been previously defined as being preferred responses. This result is consistent with the previous observations on the multiple functions of positive evaluation statements.

c. The behavior that follow negative evaluations typically is a "recycling" of the activity that immediately preceded the negative statement. In that the "recycling" or recurrence of the activity has been demanded by the teacher, as a part of her negative evaluation, it is unclear whether the negative statement in itself would have been responsible for the recurrence of the activity. In the case of positive evaluations, however, the behavior that elicited the evaluation tends to be repeated. Paradoxically, then, the immediate effect of a positive evaluation is to decrease the probability of the behavior that immediately preceded the evaluation.

d. The rareness of both positive and negative evaluations suggest that alternative methods of control are the primary determinants of the child's activity in the classroom. In particular, it appears that the teacher's structure of the classroom activities, either through prior directions or immediate instructions, serve to provide the principal controls for the child's behaviors.

As indicated above, the above statements must at this point be viewed as preliminary. Firm statements must await the detailed analysis of the data from the two studies. Nevertheless, a startling feature of the work is the apparent modest role that the mechanisms considered by socialization models to be of nuclear importance actually play in the day-to-day control of the child's activities. Furthermore, mechanisms that have been generally ignored, including the cognitive set given the child and his expectations in the setting, appear to be of overwhelming importance in actual behavior control.

Chapter 5

Social Reinforcement Satiation: An Outcome of Frequency or Ambiguity?

According to the original proposal of Gewirtz and Baer (1958), there exists a "social drive" that can be satiated in much the same way as biologically relevant need states. From the social drive model, these authors deduced that preexposure to social reinforcers (i.e., words of approval) should temporarily diminish their efficacy in behavior control. To evaluate this proposition, young children have been first exposed to various schedules or levels of social approval, then tested on simple discrimination learning tasks where correct responses elicit expressions of approval. The "social satiation" effect, i.e., a temporary decline in approval efficacy following its high density occurrence, has been frequently, but not always reported (see Eisenberger, 1970, for a review of this work).

Subsequent theoretical analyses by Gewirtz (1961, 1967) and others (Cairns, 1963, 1966; Yarrow, 1964) have raised questions about the appropriateness of considering social drives to be analogues of primary motivational systems. For whatever commonalities that might obtain, there are equally compelling dissimilarities. Unlike social response systems, homeostatic biological states are paced by rhythmic endogenous processes, cannot endure long-term postponement, and cannot be extinguished without the organism itself expiring. Such differences raise, in turn, the issue of whether the concept of satiation--with the implication of a common underlying mechanism--should be employed in both contexts.

The task for the research reported in this paper was to clarify the conditions that are responsible for the diminished effectiveness of social approval following preexposure. We were particularly interested in the processes that might account for the social satiation phenomenon, and in whether "satiation" was an inevitable outcome of the repeated occurrence of social approval. In this paper we will outline a new interpretation of the phenomenon and present data relevant to that interpretation. The proposal has as its starting point recent attempts to understand variations in the potency of social events in terms of changes in the cue properties of the reference stimuli as opposed to changes in the motivational status of the child (Cairns, 1967; Hill, 1968; Spence, 1966; Walters & Parke, 1964).

From an analysis of their cue functions, it is not obvious that recurrent exposure to a class of symbolic events, including social reinforcers, must necessarily lead to a decrement in their reinforcing properties. According to informational accounts of secondary reinforcement, the prior occurrence of an event could have either an incremental or decremental influence upon its subsequent reinforcing properties (Egger & Miller, 1963;Postman & Sassenrath, 1961; Wycoff, 1959). Frequency-of-occurrence, on this view, provides the occasion for the discriminative or nondiscriminative usage of the event. If on each prior occurrence the event serves as a reliable and nonredundant

signal (indicating performance adequacy or reward delivery), presumably its discriminative (and reinforcing) properties would be enhanced. In the case of discriminative usage, the greater the number of repetitions of the event, the more likely it should be to take on positive cue properties. Conversely, Egger and Miller (1963) have argued that recurrent usage as an "ambiguous" (i.e., redundant or unreliable) signal should fail to enhance its effectiveness. Where the event has previously established discriminative or signal properties, such as in the case of approval-approbation words, it seems reasonable to expect a dimunition in effectiveness would follow its ambiguous or unreliable usage in the experimental context.

Examination of the procedures followed in the typical "social satiation" paradigm suggests that approval comments have been used in a nondiscriminative fashion during the preexposure or satiation phase. For instance, in the original demonstration of "social satiation" by Gewirtz and Baer (1958), the experimenter dispensed approval comments on a variable interval schedule while the child was involved in some play activity (e.g., drawing, cutting out designs). When they occurred, the evaluative comments do not appear to have been contingent upon the occurrence of praiseworthy performance of the child or to have signaled the correctness or incorrectness of any discrete activity in which he was involved. It seems not unreasonable to propose that such "irrelevant" usage of the event, if continued over a 20-min period, would diminish the validity of approval behavior of the experimenter in the testing context (i.e., produce satiation). In this regard, Barnhart (1968) has shown that children learn to ignore or inattend to the interpersonal cues of an adult if they are recurrently task irrelevant or nonfunctional in the experimental setting. On the other hand, the "relevant" or discriminative recurrence of approval events should serve to maintain their effectiveness. If continued over several trials, there should be an enhancement in their control properties.

To determine whether recurrent exposure to social approval could enhance as well as diminish their subsequent potency, we independently varied the frequency-of-prior-exposure and the conditions-of-prior-exposure in this experiment. Because the contingency between the approval comments and the child's activity was of primary importance, it was necessary to develop a procedure whereby the relations between the child's performance, its consequences, and the experimenter's evaluative remarks could be systematically varied.

For those children repeatedly preexposed to a social reinforcer which had occurred as a reliable, discriminative signal, subsequent performance was expected to be enhanced. Conversely, for those children repeatedly exposed to the noninformative or random occurrence of "right," performance was expected to be depressed (i.e., the "satiation" phenomenon).

METHOD

Subjects

The children were selected from second-grade classrooms of two schools located in predominately middle-class neighborhoods. Ten boys and ten girls were assigned at random to each of four experimental groups. An additional 20 children (ten boys and ten girls) were not exposed to the experimental manipulation, but were tested on the discrimination learning apparatus (Phase II).

Apparatus

The apparatus for Part I of the experiment consisted of a marble-drop device with a built-in candy (M & M) dispenser. The device was built in the form of a rectangular clown's face, 18 X 24 in., with the marble hole centered in the "nose." The clown was enclosed so that the M & M dispenser and a marble storage-bin were concealed from the child's view. The M & M dispenser was activated by a hand switch controlled by the experimenter, and the M & Ms fell through a hole at the base of the apparatus into a paper cup. A plastic container which held 100 marbles was placed to the side of the apparatus.

The experiment for Part II consisted of a two-choice discrimination panel and a control module. Two buttons were located symmetrically above and on either side of a white signal light on the face of the panel. The choice panel itself was mounted upon a formica baseboard that extended toward the child. A handprint was inscribed on the baseboard immediately in front of the subject and equidistant from the buttons (15 in.). The signal light was activated from the control module, situated by the experimenter. The light was extinguished when the child pressed either of the choice buttons.

Procedure

Upon entering the testing room, each child was instructed to stand directly in front of the clown. He was then told:

Your first job down here today is very easy and has to do with this clown. Your job is just to take a marble, one at a time, and drop it into the clown's nose, just like this (experimenter demonstrated). Now, sometimes when you do this, he'll pay you for the marble with an M & M piece of candy; it will come out right here and fall into this cup. So your job here is to see how many M & Ms you can win for the marbles you drop. Don't start till I say you may, and once you start, just keep going, being sure to drop one marble at a time, till I say "Stop." Don't be in a hurry and be sure to pick up just one marble at a time. Do you have any questions? All right, you may begin.

The child was thus told that he would receive M & Ms only on some trials but he was not given explicit instructions on the occurrence or nonoccurrence of the experimenter's comments.

The experimenter then took a position behind the apparatus and remained there during the first part of the experiment. If the child began to pick up more than one marble at a time, the relevant parts of the instructions were repeated. All questions by the child were answered in a similar fashion. Testing continued until 100 trials had been completed (i.e., 100 occasions that the subject inserted a marble into the appropriate aperture).

The 40 boys and 40 girls who served as experimental subjects were assigned at random to one of four conditions. The treatments differed in terms of the number of occasions that the experimenter said "right" (or "that's right," or "right again"), in the number of occasions that M & M pellets were delivered, and in the relationship between the experimenter's verbalization and M & M delivery.

The four conditions were as follows:

(a) Positive discrimination, low frequency of occurrence. For subjects in this condition, 10 of the marble-drop responses were followed by the experimenter's expression of approval-assent. In every instance, the comment was immediately followed by the delivery of an M & M. Thus the occurrence of "right" and its variants was a necessary and sufficient signal for the delivery of the candy outcome event. The 10 trials on which outcome events occurred were randomly determined and the same for all 20 Ss in this group.

(b) Positive discrimination, high frequency of occurrence. For subjects in this condition, 32 of the marble-drop responses were followed by the experimenter's expression of approval-assent. As in (a), the comments were always followed immediately by the delivery of an M & M, and the trials upon which the events were delivered were randomly determined and fixed for all children in the condition. This condition differed from the preceding one only in terms of the frequency that the comments occurred during the child's performance and in the number of M & M's delivered (10 vs 32).

(c) Ambiguous, low frequency of occurrence. For subjects in this condition, 10 of the marble-drop responses were followed by the experimenter's expression of approval-assent. Also, M & M pellets were delivered on 10 trials. However, the comments and M & M delivery were programmed independently. On one occasion the two schedules overlapped, and the approval-approbation comment immediately preceded M & M delivery. In the remaining 99 trials, the two types of outcome events occurred separately or not at all. All children in this condition were given the same schedule.

(d) Ambiguous, high frequency of occurrence. For subjects in this condition, 32 of the marble-drop responses were followed by expression of approval-assent. Thirty-two M & M pellets were also delivered, but not always on the same trial as approval. As in (c), the comments and M & M delivery overlapped (on 7 trials), and on these occasions the experimenter's remarks immediately preceded M & M delivery. In the remaining trials, the two types of outcome events occurred separately or not at all. All children in this condition were given the same schedule in Part I.

An additional 20 children did not participate in Part I. They were not preexposed to the experimenter's approval comments.

Upon completion of the 100 marble-drop trials, subjects were immediately introduced to the criterion task (Part II). All subjects were treated the same in this phase of the experiment. The 20 children who were not given preexposure to approval were instructed in procedures of Part II upon entering the experimental room. The child was seated in front of the two-choice discrimination panel and was shown the handprint inscribed in the formica baseboard. He was asked to put the hand that he used in writing on top of the print and the other hand in his lap. He was then told:

Now, listen while I tell you the rules of your next job down here. See this light in the middle of this panel? Its coming on is a signal to you that you can do one of two things. Either you can pick up your hand and push this button (pointing to the other button). Be sure to use only the hand you've got on the handprint. Now, pushing either one of these buttons makes the light go out; and the light going out is a signal to you to bring your hand back and put it down on the handprint again. Do you have any questions?

Questions were answered by repeating the relevant part of the instructions. In accord with the standard procedure for assessing social reinforcer effectiveness (e.g., Gewirtz & Baer, 1958; Landau & Gewirtz, 1967), the children were not told that one choice would be considered "correct" and the other "incorrect."

Each child was then given 30 trials on the choice discrimination apparatus. One of the two buttons had been arbitrarily assigned to be the reinforced choice for each subject (each button was correct for half of the children in each group). Each time the child pushed this button, the experimenter immediately responded with one of the approval-assent comments used in Phase I. The experimenter recorded which button was chosen on each of the 30 trials.

At the end of the 30 trials, the child was thanked for his cooperation, given his M & Ms in a plastic bag, and was asked not to tell his classmates what he had done until everyone had been given a chance to participate. Also, children in both low frequency groups and in the no-exposure group were given additional M & Ms, so that all children had received the same amount of candy by the conclusion of the experiment.

RESULTS

The primary findings concern the children's performance on the discrimination learning apparatus (Phase II): namely, the number of occasions that they selected the response that elicited social reinforcement. As shown in Figure 1, the two groups that were assigned to the low frequency conditions did not differ in performance, either from each other or from the group given no preexposure to social approval. However, a marked difference was obtained between the two high-frequency groups. The data include that if the verbal event had repeatedly occurred in a discriminative fashion, it was strikingly more effective in the assessment phase than if it had occurred frequently as an unreliable, ambiguous signal.

Statistical analyses confirm that the primary differences shown in Fig. 1 are highly reliable. A 2 X 2 analysis of variance indicates significant effects for signal manipulation (F (1, 76) = 14.78, $p < .001$), and the frequency by signal manipulation interaction (F (1, 76) = 23.09, $p < .001$). Frequency, in itself, did not yield a statistically reliable effect, doubtless because of the significant interaction with signal manipulation.

The Dunnett T test (Winer, 1963) permits the simultaneous comparison of the performances of each of the experimental groups to that of the group

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Insert Figure 1 about here

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given no preexposure. The group given 32 positive discrimination trials in the induction series (high frequency, positive) performed significantly above the nonexposed group ($p < .01$). On the other hand, the high frequency, ambiguous group performed significantly below the nonexposed group ($p < .05$). Neither of the low-frequency conditions differed from the nonexposed group.

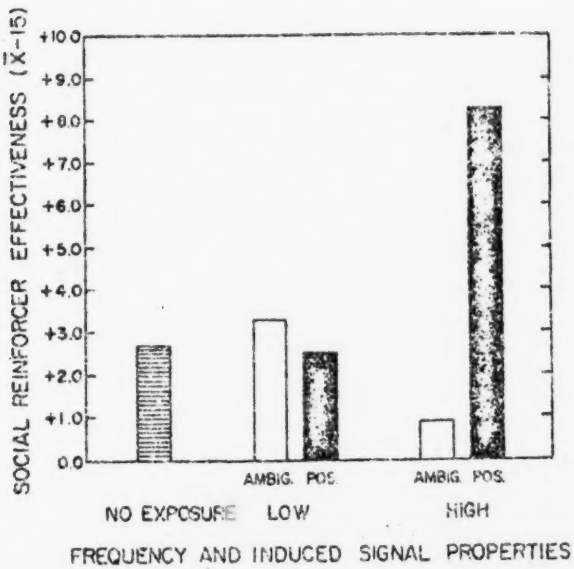

FIG. 1. Social reinforcer effectiveness as a function of number of prior presentations and degree of ambiguity of the social reinforcer. The effectiveness measure plotted is the mean number of occasions that *Ss* in a given condition selected the response that elicited *E* approval over 30 trials minus the number that would be obtained by chance responding (15). The unshaded columns refer to conditions in which the approval was used nondiscriminately (*ambig.*), the heavily shaded columns to conditions in which it was used as a positive signal (*pos.*), and the lightly shaded column to the condition in which no experimental preexposure to approval was given.

In the light of the proposal that social "satiation" might reflect the continued nondiscriminative use of social approval, the comparison between the low-frequency and high-frequency "ambiguous" conditions was of particular interest. In accord with previous findings (e.g., Landau & Gewirtz, 1967), the more frequently that the word was used, the less effective it was in the control of discrimination learning (t (38) = 2.04, $p < .05$). In this regard, two additional results deserve comment. First, it should be observed that the "highly satiated" performed at the chance level; i.e., the children performed as if the event had not occurred, (t (19) = 1.26, $p > .10$). Second, the nonexposed children did not differ from those mildly "satiated" (i.e., given 10 nondiscriminative preexposures).

A similar comparison was made between the conditions given the two levels of discriminative preexposure. As suggested by the 2 X 2 statistical interaction, the difference between the low-frequency and high-frequency condition was highly significant (t (38) = 4.82, $p < .001$).

Parallel results were obtained if the entire set of analyses is repeated considering only the final 10 trials of the two-choice discrimination performance. Supplementary analyses indicate that sex-of-subject, choice of button (right or left), and school, were not statistically significant, either as main effects or in interaction with the two primary factors.

An additional comment is in order on the nature of the response strategies followed by children who performed at or near "chance" level. On the two-choice response task used in Phase II, the children typically achieved such scores (i.e., 14-16) by adopting a single alternation or, less frequently, a double alternation response pattern. Chance level performance in a condition indicates simply that virtually all of the individuals in the condition failed to change from a response strategy that was not ordered by the approval contingency to one that was.

DISCUSSION

From the present data, it appears that frequency plays a major role in determining social reinforcement efficacy only insofar as it provides the occasion for the discriminative or nondiscriminative occurrence of these events. The "social satiation" phenomenon was obtained, but only where preexposure was combined with recurrent nondiscriminative usage. The fact that frequency *qua* frequency is not sufficient to produce a decrement in reinforcement properties was demonstrated by the striking enhancement of the control properties of approval following its continued use as a discriminative signal.

One feature of the results requires special comment; namely, the modest learning effects obtained under most of the conditions of social reinforcement. Although a nonreinforcement condition was not included in this experiment, the theoretical expectation that random responding would yield a mean of approximately 15.00 (30 trials, two-choice apparatus) seems justified. Except

for the group assigned to the positive discrimination, high frequency condition, the experimental groups performed near chance level. However, only in the ambiguous, high frequency condition was the performance not reliably different from chance ($p < .05$). These results on the modest effectiveness of social reinforcement virtually replicate the findings obtained in three companion studies of this series (Cairns, 1967, 1970; Cairns & Paris, 1971), which involved different experimenters, different expressions of approval, and different experimental learning tasks. This general finding--that positive social reinforcement events are relatively ineffective in simple discrimination learning tasks when used without the benefit of special instructional sets or prior discriminative occurrence--is consistent with the reports of others (see for example, Hill & Walters, 1969, p. 192; Parton & Ross, 1967, p. 325; Spence, 1966). It must be added that the above experiments were limited in time spent in interaction and that approval comments have been shown in some circumstances to be quite influential in behavior control (see, for example, Yarrow, Burton, & Scott, 1968). Nonetheless, it seems clear that transituational reinforcement effectiveness is not an intrinsic property of approval or a necessary outcome of its occurrence.

Although the present work was not directly addressed to the issue of why "undefined" social reinforcers tend to have such a modest effect upon performance in this setting, the experiment itself suggests a plausible, albeit speculative, answer. Recall that when "right" repeatedly occurred in the experiment in a nonsystematic fashion, unrelated to the "correctness" or "incorrectness" of the child's specific actions, then its subsequent influence upon choice behavior was further diminished. It may be the case that a parallel process has occurred *in situ* for all of the children, prior to their entering the experimental context. To the extent that words of social approbation, such as "right" or "good" have been used indiscriminately outside the laboratory, their efficacy in the control of specific actions would have been diminished. This proposal is consistent with the "Pollyanna" phenomenon described recently by Boucher and Osgood (1969), i.e., that expressions of approval-approbation are used more generously and diffusely than are expressions of disapproval.

Whatever the merits of the above analysis, it was surely the case that most of the children in this experiment simply did not behave as if there was any contingency between their specific choices and the approval behavior of the experienter. They appeared to be more attentive to stimuli immediately involved in the task--where to keep their hands (one on the board, the other on their lap), when to press the button (after the "on" light appeared)--than they were to the interpersonal behaviors of the experimenter. Hence the experimenter's remarks appeared to be but one of the stimulus dimensions that was competing for the child's attention and by which their behavior could be ordered.

Returning to the theoretical issue raised in the introduction, the question must be asked as to what was modified by the experimental operations: The social drive level of the subject or the cue properties of the stimulus? Although the repetition-induced reduction in effectiveness that was obtained is consistent with the social drive analog is maintained, then the position must at least be revised to account for the fact that some instances of preexposure fail to lead to "satiation."

The present work investigated the alternative interpretation that the evaluative remarks of the experimenter were symbolic events whose cue functions could be directly altered. The treatments adopted were not unlike those typically employed to introduce secondary reinforcement properties (positive discrimination) or to extinguish them (ambiguous). One of our basic concerns was to determine whether or not the informational processes that account for the reinforcement efficacy of nonsocial events also account for variations in the efficacy of social stimuli. The results, for the most part, yield an affirmative answer.

Having noted the apparent similarity between social reinforcers and nonsocial secondary reinforcers, a comment on certain differences is in order. Companion experiments have provided direct comparisons between the effects obtained in the manipulation of the signal properties of social approval and the effects obtained when parallel operations are used with nonverbal events (Cairns, 1970, Exps. 1-3) and nonmeaningful verbal events (Robert B. Cairns & Vera C. Warren, unpublished). In general, these studies have demonstrated that positive signal properties are more easily induced for common expressions of social approval than for previously "neutral" events. Conversely, neutral events, verbal and otherwise, readily take on negative reinforcement properties following their use as negative signals while social reinforcers do not. These findings are consistent with the proposal that "social reinforcers" have previously stored information properties that interact with whatever experimental conditions that prevail. In the light of these findings, it has been speculated that short-term, ambiguous usage of social approval words is less likely to change their denotative meaning for the child than it is to produce selective inattention to them (Cairns, 1970).

Summing up, the present work confirms that one class of interpersonal behaviors--evaluative comments--is susceptible to direct manipulation. The effectiveness of explicit expressions of approval can be enhanced, or diminished, according to their contemporaneous validity in the experimental setting. The possibility that this phenomenon reflects a more general process by which the validity of dyadic cues is maintained in ongoing social interactions seems worthy of further attention.

SUMMARY

Demonstrations of social reinforcer satiation have shown that the repeated occurrence of approval-assent events tends to diminish temporarily their reinforcement efficacy. This experiment independently evaluated the contributions of frequency of the signal and its ambiguity to the satiation phenomenon. One hundred second-grade children served as Ss. The primary treatments involved two levels of frequency of prior presentation of the social reinforcer (the word "right"), and two levels of signal reliability (discriminative and ambiguous). The results indicate that the higher levels of "satiation" had opposite effects, according to whether the event had recurred as a reliable, nonredundant signal, or as an ambiguous one. Extended use as a discriminative event served to enhance the effectiveness of the social reinforcer ($p < .001$), while extended use as an ambiguous signal reduced its effectiveness.

Chapter 6

Summary and Some Implications

Within the limits of the procedures employed in the analysis of social reinforcement events in the laboratory, certain statements on the role and functions of "social reinforcement" events are permitted.

a. Undefined positive evaluations in simple learning tasks are effective to the extent that they signal to the subjects directions as to the appropriateness of their activities. This informational function can be performed by nonmeaningful words, if they have been defined, and can be reversed by the appropriate opposite definition.

b. Negative evaluations, possibly because they have previously occurred in a systematic and response-specific fashion, do not require definition in the context of short-term learning experiments in order to be effective.

c. A parsimonious re-interpretation of the "social satiation" effect would emphasize the extent to which the positive evaluation words are used indiscriminatively and nonmeaningfully in the test setting. That is, the effect that has been previously attributed to a reduction in the drive value of the social reinforcement word can then be viewed in terms of the reduction of the signal properties of the event. This generalization holds across a variety of operations that have been associated with the satiation-deprivation concept, including short-term preexposure to the events as well as long-term maintenance in an institutional setting.

The analyses of the multiple functions of social reinforcement in the classroom seem consistent with the above laboratory findings. In particular, the data indicate that social approval events are used in a broad range of circumstances, and refer not only to the adequacy/inadequacy of specific acts but to events that are quite unrelated to the acts of specific children. These would include use patterns in which the events function primarily as linguistic markers, signalling to the child the end of one activity or sentence and the beginning of another. Paradoxically, the least-used events (criticism and verbal punishment) tend to be considerably more effective in actual behavior control than do the more frequently occurring events (positive evaluative statements).

The direct analysis of the events that are most effective in the classroom is at the writing of this report only partially complete. The preliminary results indicate, however, that in actual dialogue the control properties of positive evaluation are minuscule relative to the directive properties of teacher behavior. Hence further focus on the factors effective in behavior control might well concentrate upon the nature of the structure, and its clarity, in the direction of the child's activity.

What has yet to be solved is why there remains such a marked differential in actual usage of positive and negative evaluative statements, especially in the light of their differential behavior control properties. There seem to be three possibilities.

First, the behavior provoked in the child by negative statements may serve to control their subsequent usage. Specifically, the negative dyadic feedback provoked in the child may, in effect, inhibit the occurrence of the teacher produced evaluations. By the same token, positive evaluations can occur frequently because they tend to not disrupt the behavior of the child or of the teacher. While they may fail to alter the nature of the relationships, they do not disrupt it either.

Second, the evaluative expressions of the teacher may be self-regulating. To the extent that the events provide the states that are uncomfortable for the user, they might be expected to occur infrequently. It should be observed that this control of negative reinforcement frequency is not unrelated to the possibility of dyadic feedback control, in that the processes could operate jointly to monitor the nature of the criticism and negative evaluations of the teacher.

Third, positive evaluations could provide services that are not immediately obvious in the short-run analysis of their effectiveness. Rather than serving to "reinforce" behaviors of the child and the class, they could serve as background events for the child's and the teacher's subsequent interactions. To the extent that the background is conducive to the maintenance of the relationship, and maintaining the child voluntarily at the task, it could be essential in the long-term effectiveness of teacher behavior. It should be underscored, however, that the use of "social evaluations" to set the tenor of the relationship or the classroom interaction could not be easily interpreted in terms of reinforcement processes. Instead, such functions seem more logically subsumed as contextual in nature, where the conditions of the interaction are somehow "set" by the occurrence of the event. In this sense, the distinction can be drawn between the "motivational" or context-setting function of such events and the consolidating or "reinforcement" function of the event. Research in the laboratory as well as in the natural setting has failed to clarify the potential "motivating" influence of social evaluations. Both technically and practically, however, it would be inappropriate to refer to such function as "reinforcement."

Beyond social reinforcement

Certain practical and theoretical recommendations are suggested by the above results and conclusions. In terms of practice,it would seem entirely reasonable to suggest that teacher-training programs should re-evaluate the practices encouraged in their curriculum and practicuum sequences. In particular, the indiscriminative and superfluous showering of approval statements, regardless of the adequacy or accuracy of the performance of the child, may serve to retard the subsequent effectiveness of the teacher's discriminative statements.

Alternatively, the importance of discriminative, informational, and instructional feedback could be emphasized in such programs.

Theoretical statements that have treated "social reinforcement" and "punishment" as simple, discrete events in behavior control tend to belie the complexity of the social and verbal interchanges in which these events are embedded. The long-standing argument that negative reinforcement is not effective because it is not informational (telling the child what not to do rather than what to do) simply is not supported by direct observations of classrooms interactions. In real-life interchanges, teachers are not limited to one- or two-word evaluation statements, as is the experimenter in the traditional learning experiment. Instead, the comment (positive or negative) is accompanied by considerable information on the nature of the response and precisely how the response pattern must be modified in order for the performance to be considered correct.

In the light of the discrepancy between actual use patterns (which reliably confound directive information with inhibitive effects of negative social reinforcement) many of the arguments concerning the deleterious effects of such outcomes would appear to be irrelevant. What seems called for at this point is a critical re-examination of the assumptions concerning the role of "reinforcement" (social or otherwise) in the learning process. Specifically, these data suggest that the actual learning process itself may have very little to do directly with the gross social evaluations of the teacher. Indeed, in at least some instances, the stereotyped "social reinforcer" may have the paradoxical effect of retarding the acquisition of the correct
The burden that has been assigned to "social reinforcement" processes by social learning theories appears to be borne, in actual classroom practice, by the careful structure of activities and supervision of performance, coupled with instructions as to when errors arise and how they may be corrected.

The above comments should not be interpreted to mean that the pleasant, praiseful behavior of the teacher cannot serve a useful function in classroom direction, motivation, and control. It is regrettable that, at this juncture, we have precious little information on such functions and whether performance is in fact positively correlated with their occurrence or nonoccurrence. The influence of positive evaluation upon classroom morale, pupil and teacher satisfaction, and performance has yet to be systematically investigated.

Appendix

Acknowledgments

The principal investigator must thank his collaborators for their contributions to the several studies reported here. The work reported in Chapters 2 and 3 was undertaken with Scott G. Paris. Dr. Paris assumed the primary responsibility for the preparation of Chapter 3. The work reported in Chapter 4 was completed with the assistance of Mary Lounsbury and Sallee Jenkins. The study of social satiation (Chapter 5) was completed in collaboration with Vera Warren.

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Publication and dissemination

The material reported in two of the chapters has been submitted and accepted for publication. The work reported in Chapter 2 appeared in Child Development (1972) and the study reported in Chapter 5 in the Journal of Experimental Child Psychology (1972). In addition, a summary statement of the implications of the studies appeared in a chapter authored by the principal investigator that was published in the volume Attachment and Dependency (1972). Work involving the study of retarded children (Chapter 2) and certain of the ethological observations (Chapter 4) was undertaken in conjunction with a project supported by grant OEG 9-242178-4149-032.

Listed below are the references for the publications that have appeared at the time of the submission of this report, and which were supported wholly or in part by funds provided in the present project. The remaining unpublished material reported in Chapters 3 and 4 is currently being prepared for publication and distribution.

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